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Arnold P. Klee

with the Mississippi, which Schoolcraft's data make less than 6*—with the lower part of the Ganges, which Major Rennell makes less than 5—we need not hesitate to admit the fall of the Bahr-el-Abiad and the Nile to be amply sufficient to convey the waters of the Tsad into the Mediterranean.

But to pass over the, at best uncertain, results of barometrical admeasurements, if it should be found that the country to the eastward is of the same kind as that to the westward of the lake, a fall of two or three inches per mile† would be quite enough for a series of lakes and swamps to drain off the water; and the supposition that such is the fact is consistent with every information that has as yet been collected. The Bahr, now Wad, el-Ghazal, the very name of which implies the nature of the surface, and which, according to the accurate Burckhardt, is 'a wide extent of low ground, without any mountains,' is the first beyond the lake; then Fittre, in which by all account there is a great lake, or chain of lakes; beyond, in Dar Karka, there is said to be a great river, called Bahr-el-Freydh, or the inundating river, and beyond this a large fresh-water lake, called Wadey Hadaba; and then farther on is Dar Saley, of which Burckhardt says—'In the rainy season, which usually lasts two months, large inundations are formed in many places, and large and rapid rivers then flow through the country. After the waters have subsided, deep lakes remain in various places, filled with water the whole year round, and sufficiently spacious to afford a place of retreat to the hippopotami and crocodiles which abound in the country.' Then we are informed by M. Jomard, that a French gentleman, of the name of Hey, has been up the Bahr-el-Abiad 180 miles, and that it there maintained the character given to it by Bruce, of being a 'dead-flowing river.' Putting these notices together, and considering what the Yeou is to the westward of the lake, as far as Katagum, where not a pebble is to be found on the surface, which is one flat of lake, swamp, or sand, we think we need not boggle much as to the insufficiency of the *fall* for carrying the waters eastward of the Tsad. We must therefore adhere to the conclusion we came to in a former Article, viz. that the junction of the waters of this great lake with those of the Nile is not only *possible*, but extremely *probable*.

* Schoolcraft, by an extraordinary blunder of making the *dividend* the *divisor*, gives a mean fall of *two feet three inches* to the Mississippi; and Jomard, who has written three pamphlets on the slopes of rivers, repeats the blunder.—See *Quart. Rev.* No. LVII.

† The lower part of the Mississippi has no more fall than this. Major Long has calculated the head of the Illinois at 450. The length of this river to its junction with the Mississippi is 1200 miles, and of the latter from thence to the Gulph of Mexico 1200 more: the fall being 450 feet in 2400 miles, or $2\frac{1}{2}$ inches per mile—yet with this gentle slope its current is impelled with a velocity of more than three miles an hour.—*Quart. Rev.* No. LVII.

ART. XII.—*A Letter to Sir Henry Hallford, Bart. President of the College of Physicians, proposing a Method of inoculating the Small-pox which deprives it of all its Danger, but preserves all its Power of preventing a second Attack.* By R. Ferguson, M. D. Member of the College of Physicians of London and Edinburgh. 1825.

ABOUT twenty years ago, when it was proposed to purify the medical profession from quackery and ignorance by legislative enactments, the late Dr. Gregory of Edinburgh published a letter on the subject, in which he remarked that ‘England is a free country, and the freedom which every free-born Englishman chiefly values, is the freedom of doing what is foolish and wrong, and going to the devil his own way.’ This is strikingly exemplified in the present state of vaccination in Great Britain, compared with its state in other countries of Europe. In the latter, general vaccination was ordered by government; no one who had had neither cow-pox nor small-pox could be confirmed, put to school, apprenticed, or married. Small-pox inoculation was prohibited; if it appeared in any house, that house was put under quarantine; and in one territory no person with small-pox was allowed to enter it. By such means the mortality from this disease in 1818 had been prodigiously lessened. In Copenhagen, it had been reduced from 5500 during 12 years to 158 during 16 years. In Prussia, it had been reduced from 40,000 annually to less than 3000; and in Berlin in 1819 only 25 persons died of this disease. In Bavaria only 5 persons died of small-pox in eleven years, and in the principality of Anspach it was completely exterminated. In England, on the other hand,—in England, the native country of this splendid and invaluable discovery, where every man acts on these subjects as he likes, crowds of the poor go unvaccinated; they are permitted not only to imbibe the small-pox themselves, but to go abroad and scatter the venom on those whom they meet. A few years ago it broke out in Norwich, and carried off more persons in one year, than had ever been destroyed in that city by any one disease, except the plague. A similar epidemic raged at Edinburgh; and last year it destroyed within one of 1300 persons in the London bills of mortality.

Before the introduction of inoculation, the small-pox was the most loathsome and fatal disease with which Great Britain was afflicted. It killed about one out of four of those whom it attacked, and left many of the survivors with blinded eyes, scarred faces, and ruined constitutions. When, therefore, inoculation was introduced into this island, it seemed a prodigious improvement; by this simple contrivance, especially after the
method

method had been improved by the Suttons, a disease which killed one out of four, was transmuted into a disease which killed only one in several hundreds. If this had been the only result, the benefit would have been unmingled, and great in a degree almost incredible, but it brought with it an evil still greater than the good; by perpetually keeping up a supply of the contagion, this disease, which had been propagated only at intervals before, was now propagated perpetually, far and wide, among those unprotected by inoculation; the annual mortality was greatly increased, and that, which all had hoped to find a blessing, turned out to be a national curse.

It is not surprizing, therefore, that when Jenner disclosed the wonderful truth, that the artificial production of a trifling and harmless disorder would impart a charmed life over which this loathsome disease should have no power, his discovery was soon hailed with enthusiasm by almost the whole medical profession. In the general exultation, its infallibility was over-rated; the advocates for vaccination affirmed that it was an infallible protection from the small-pox, and every instance of small-pox after cow-pox was explained away. Such cases are now no longer to be denied. Patients have caught the small-pox who had been vaccinated by the most skilful vaccinators, even by Jenner himself, and it is generally acknowledged that out of a number of vaccinated persons, some do not resist the contagion of the small-pox.

The time has now arrived when all intemperate excitement on the subject is at an end. Vaccination has been tried on a vast scale for seven-and-twenty years, and we have a stock of experience whereon to determine (not with mathematical precision, yet with enough for the guidance of our conduct) to what extent vaccination has disappointed our expectations, and whether this disappointment is sufficient to induce us to abandon the practice altogether.

This general question resolves itself into two particular ones: 1st. What is the proportion of the vaccinated who are liable to the infection of small-pox; 2d. Do they suffer when infected as severely as those who have never been vaccinated, or is the small-pox in their case mitigated and converted into a harmless disease?

From the introduction of vaccination down to the present time, numerous instances have been recorded of an eruptive disease, similar to small-pox, in persons previously vaccinated. But though these records afford specimens of this occurrence, they throw no light on the question of its frequency; we pass them over, therefore, and select a few instances in which the security afforded by vaccination has been tried on a large scale, and the
first

first which we shall notice is a small-pox epidemic* which raged in Norwich in 1819, and which has been described by Mr. Cross, a well-informed and indefatigable surgeon of that city. The small-pox had been extinct in Norwich from 1813, to June, 1818, when a country girl, travelling from Yorkshire, caught it in a market-town through which she passed, and was taken ill soon after her arrival at Norwich. This girl was the innocent cause of the death of more than 500 persons; all of whom might have been saved if there had been a small-pox quarantine. For several months it crept from house to house like a spark of fire along a streak of gunpowder, but in February, 1819, it reached a charity school, a magazine of combustibles, and the explosion scattered firebrands all over the city. More than 3000 persons caught the disease; it proved fatal to 530; 43 were buried in one week, 156 in June, and 142 in July.—Now, there were in Norwich about 10,000 vaccinated persons exposed to the full rage of this very contagious and malignant small-pox. How did they stand it?

In 42 poor families, there were 91 persons who had been vaccinated at various periods from 1798 down to the commencement of this epidemic; these persons were continually in the same room, and many in the same bed, with those suffering small-pox; of these 91 persons, only two caught the small-pox. But besides those exposed to the contagion, several hundreds of the vaccinated were inoculated with small-pox. In one out of 40 or 50 there came out a slight eruption, which lasted only four or five days. Thus it appears that the proportion of vaccinated persons who were susceptible to the contagion was rather more than two out of every hundred. But when vaccinated persons caught the small-pox, what degree of severity did this disease assume? 'In no instance,' says Mr. Cross, 'has regular small-pox, as far as I have been able to ascertain, been produced. In about one in 40 or 50 a spurious eruption has appeared, in some presenting a few irregular pimples, in others resembling the small-pox; but I have not learnt that the latter have ever proceeded regularly, invariably drying up in four or five days, and never taking the course of regular small-pox.' 'Full-length small-pox in those who have been vaccinated,' continues Mr. Cross, 'has been so rare that I have not met with a single instance either in my own practice, or in my inquiries amongst the poor.' A few such cases, how-

* An epidemic is a prevalent disease, whether its prevalence arises from contagion, or from an unhealthy state of the air. In our last Number, under the article Plague, we consented to restrict this word to the latter class of diseases; this had been already done by the 'Anti-contagionists, and we were unwilling to waste time in a dispute about words when we have so heavy an account to settle with them about facts and reasonings.
ever,

ever, occurred under the care of some other surgeons. Six vaccinated persons caught the small-pox, which ran its full length, and two out of the six died. Those who were believed to have had small-pox formerly did not escape. Mr. Cross relates several instances in which the disease seized and ran its full length upon persons who were even *marked* by small-pox; and he gives at length the story of one patient who died; adding, 'such examples have been very frequent.' When the small-pox occurred in those who had had small-pox, it does not appear to have been rendered short and mild, as in those who had had cow-pox. The result of this Norwich epidemic, therefore, was as follows: of those persons who had neither had cow-pox nor small-pox, about 3000 caught the disease, and 530, that is more than one in six, died; of those who had previously had the small-pox, many caught it again, as severely as if they had never had it before, and one died; of those who had been vaccinated, amounting to 10,000, rather more than two in every hundred were affected by the small-pox contagion, but it almost invariably produced a short and trifling disease. In only six instances did it occasion the full-length small-pox, and in two only did it terminate fatally—two instances out of 10,000!

In the 52d volume of Hufeland's Journal for 1821, Dr. Gittermann has described a small-pox epidemic which prevailed at Emden in 1819 and 1820. In an hospital in which there were 200 children, most of them vaccinated, 8 of the vaccinated either caught the small-pox, or took it by inoculation; but it was that short and mild disease which is called modified small-pox. Here one in twenty-five took the abbreviated small-pox. In a letter from the island of St. Vincent, quoted by Dr. Thompson of Edinburgh in his 'Historical Sketch of the Opinions of Medical Men on the Secondary Occurrence of Small-pox,' (page 379,) the writer states that he had inoculated with the small-pox 130 negroes whom he had formerly vaccinated. Of these, six took the mild and abbreviated small-pox, that is, about one in 21.

We have here selected, out of a multitude of records, instances in which the vaccinated were exposed, under the most unfavourable circumstances, to singularly contagious epidemics, and in which the estimate of security is stated at the lowest. We could crowd our pages with statements on respectable authorities of many thousand persons who had undergone vaccination, and in which no individual had been known to have been subsequently affected by the small-pox.

During the years 1818 and 1819 the small-pox was epidemic in Edinburgh, Lanark, and other parts of Scotland, and an account of it has been published by Dr. John Thompson of Edinburgh,

burgh, professor of military surgery in that university, a man whose ability, zeal, and learning are universally recognized. This account affords no information about the proportion of vaccinated persons who caught, and the proportion who resisted, the small-pox; but it affords very valuable information about the degree of severity which the small-pox assumed when it attacked those who had been previously vaccinated. It was almost invariably an abbreviated and mild kind of small-pox, so exactly resembling chicken-pox, that Dr. Thompson believes them indistinguishable. 'In the characters,' says he, 'by which it has of late been supposed that chicken-pox may be distinguished from modified small-pox, observation leads me to place no confidence whatever.'

Dr. Thompson saw 836 cases of small-pox: of these 281 occurred in persons who had never had either small-pox or cow-pox, and rather more than one-fourth of the number died; 71 had already had small-pox, and of these two died; 484 had been vaccinated, and of these one only died. The numerous cases of small-pox in persons who had already had it before, are very remarkable, and will teach the public that, although vaccination is not an infallible preservative against small-pox, neither is small-pox itself. Notwithstanding the numerous cases of small-pox in persons who had been vaccinated, it was so trifling a disease, that only one died out of nearly 500: 'results,' says Dr. Thompson, 'which evince the beneficial effects of vaccination in protecting the human constitution from the *dangers* of small-pox, and the great advantages which must ultimately arise from the universal adoption of this practice.' In another place, he remarks,

'It must now be universally allowed, that the protection which vaccination affords against the *fatality* of small-pox is at least equal, if not superior, to that which is afforded by having passed through the small-pox themselves, even in the natural way—a degree of security which, though it may not be absolute, is surely as great as can reasonably be expected of any human invention.' 'It has been impossible to see the general mildness of the varioloid epidemic in those who had undergone the process of vaccination, and the severity, malignity, and fatality of the same disease in the unvaccinated, and not to be convinced of the great and salutary powers of cow-pox in modifying small-pox in those who were afterwards affected with this disease. Proofs cannot be imagined more convincing and satisfactory of the efficacy of the practice of vaccination, and of the incalculable benefits bestowed upon mankind by its discoverer, than these I have had the pleasure of witnessing. It has been very agreeable, also, to observe, that the terrors at first excited by the occurrence of this varioloid epidemic in the families of those who had undergone cow-pock inoculation, have gradually given way in the progress

progress of the disease; and that the comparison of small-pox in their modified and unmodified forms has often forced a conviction of the advantages of cow-pock inoculation upon the minds even of the most ignorant and prejudiced, and induced them to seek protection for themselves and their offspring in a practice which they had formerly neglected or despised.'

Last year (1825) the small-pox was singularly prevalent and fatal in London. Before the discovery of vaccination, the average annual mortality of twenty years within the London bills, from small-pox, was 1809 persons. This had been gradually diminishing since the introduction of vaccination, until in 1818 it was reduced as low as 421. Last year no fewer than 1299 persons died of small-pox, within the London bills of mortality; 419 cases of small-pox were admitted into the Small-Pox Hospital; of these, 263 occurred in persons who had neither had small-pox nor cow-pox, and 107 died; that is about 41 out of each 100, an enormous mortality; two had already had small-pox, and one of the two died; 147 were supposed to have previously had the cow-pox; of these 122 had the disease in a mild and abbreviated form, technically called the modified small-pox; in 25 it ran its full length, and in 12 of these it terminated fatally. Thus, if we are to take it for granted that these 147 persons who declared that they had been vaccinated, really had had the cow-pox, nearly one in 12 died. But had these 12 persons really had the cow-pox in a perfect and satisfactory way?

'My rule,' says Dr. George Gregory, the physician to the Small-Pox Hospital, on whose authority this statement depends, 'my rule throughout the year was never to exclude any one from this class who could show a scar, or, failing in that criterion, who retained a *distinct recollection* of having undergone some kind of protecting process. In many of the unmodified and fatal cases just referred to, *the evidence of prior vaccination was very imperfect*, but in others the proofs of vaccination were distinct and undeniable.'

Thus, in five the scars are described as not perceptible, which means, we suppose, that they had no scars at all. In one the scar resembled that of a burn, and in two others it was small, and wanted the characteristic appearance. All of them had been vaccinated in the country.

In the cases of small-pox after cow-pox, which occur among the poor of this metropolis, the history of the previous vaccination, which is an essential part of the evidence, is often singularly unsatisfactory. A country bumpkin comes to town, catches the small-pox, goes into the hospital, says that he was vaccinated some years ago, and shows his arm, on which there is sometimes a large scar, sometimes a small one, and sometimes none at all. All that can be learnt is, that some village *Æsculapius* had pricked

his arm with a lancet, and has left a mark or no mark on the part, but nothing can be learnt of the progress of the disease.

That when the poor are vaccinated in numbers, many of them pass through the disease in a way not to be relied on, is not a matter of conjecture. When the small-pox was raging in Norwich, in 1819, Mr. Cross vaccinated 500 persons; of these 28 had the disease in an unsatisfactory way, either from the vesicles being broken, or from their appearance deviating from that of ordinary cow-pox; 35 did not take the disease; and 24 either never returned after they had been vaccinated to show the progress of the disease, or ceased to attend after the first few days; so that Mr. Cross had no opportunity of ascertaining whether the vaccination had been complete. It is not, therefore, a probable conjecture, but an absolute certainty, that when a multitude of the poor are vaccinated, there are many cases in which there is no evidence of the perfection of the vaccination. It may have been perfect, it may have been imperfect, but it is impossible to determine either the one way or the other. We are far from referring all the cases of small-pox after cow-pox to imperfect vaccination, yet we cannot resist quoting Mr. Cross's pointed remark, that the number of vaccinated persons in regard to whom there is no evidence whether they had the disease satisfactorily or not, is *as great* as the number of persons who have the small-pox after cow-pox.

From the facts and calculations which we have laid before our readers, and the multiplication of which would be attended by no equivalent advantage, the following inferences may be safely drawn: 1st. That vaccination in a vast proportion of cases affords complete security against the contagion of small-pox: 2dly. That in a small proportion varying under different circumstances, but at the highest not to be estimated at more than one in 20, vaccinated persons do not resist the contagion altogether,—but resist it so far as to suffer none of its dangers, having its violence diminished, its length curtailed, and converted into a short, mild, and trifling disease: 3dly. That out of numerous cases in which small-pox occurs after cow-pox, the small-pox is sometimes undiminished in length and violence, and sometimes even terminates fatally; but that these cases—trifling even if compared with those in which the small-pox is abbreviated—when contrasted with the number of vaccinated who resist the contagion altogether, dwindle down to a number scarcely worth calculation.

It has been remarked, even by medical men, as surprising and inexplicable that small-pox after cow-pox is now more frequent than formerly, and that it most commonly occurs in persons who have

have been vaccinated several years. Where is the mystery? More vaccinated persons take the small-pox now than formerly, because there are more vaccinated persons to take it. From the discovery of vaccination to the present time their numbers have been augmenting; for although death would every year subtract some, vaccination would every year add a vast many more. That it has been gradually spreading over a larger surface of the population, and encroaching upon that which is unprotected from the small-pox, is obvious by comparing the mortality from small-pox in London during the first ten years after vaccination, and the mortality from the same disease during the second ten years. The former amounted to 13,690, the latter only to 8729, and in the year 1818 it was reduced as low as 421. Again, more persons catch the small-pox among those whose vaccination is old than among those whose vaccination is recent—because the former are far more numerous than the latter. The old are the gatherings of many years, the new the gatherings of only a few. This is not conjecture. When the small-pox raged in Norwich in 1819, the recent vaccinations were about one-tenth of the whole, nine-tenths being from three years old to more than twenty. In this instance, too, the proportion of recent vaccinations was unnaturally swelled, as the panic produced by the epidemic occasioned numbers to be vaccinated who would have neglected this precaution under ordinary circumstances.

It is a prevalent notion that vaccination affords protection only for a time; that its influence gradually wears out; and some have pretended to state how many years it lasts with undiminished force, how many years it gradually decays, and in how many it ceases altogether, leaving the constitution open to the inroads of small-pox. However probable this opinion may at first sight appear, on more attentive consideration it will be found not even probable, for it is contrary to analogy, as far as we have any; in all other instances in which a disease destroys the susceptibility to a repetition of it, it destroys it through life. The influence of small-pox, scarlet fever, measles, whooping-cough, which leaves the constitution insusceptible to a recurrence of these diseases, never wears out; we do not find that in these instances the patient is secure for so many years, less secure for so many more, and at length as susceptible to a repetition of these diseases as if he never had them. A few persons, it is true, take these diseases twice, but these are only the very rare exceptions to the general rule. But the notion is contradicted by experience; if it were true, ought we not to find that, in all the instances in which small-pox occurred after cow-pox, it occurred several years from the date of vaccination, and that the far greater

number of such cases lay among those whose vaccination was the oldest? Is this the fact? No. We find instances of small-pox after cow-pox at all periods, from a few months after vaccination up to many years; and on the contrary, grown-up women who were vaccinated on the first introduction of the practice, nursing their children for the small-pox, without catching it themselves.

To *prove* that the protecting power of vaccination lasts only a few years, would be the hardest stone that has been thrown at the name of Jenner; but hitherto the charge has not been proved. That small-pox after cow-pox is more common now than formerly, and among those who have been vaccinated many years than among those who have been vaccinated a few, for the reasons we have already stated, proves nothing. If among a number vaccinated lately and an equal number vaccinated long ago, a far larger proportion of the latter caught the small-pox than of the former, this would go to prove the fact; but no such case has ever been made out.

Let those who would abandon vaccination because it is not infallible, look the consequences of such conduct fairly in the face. Would they omit both inoculation and vaccination, and expose the nation unprotected to the natural small-pox, a disease which kills one-fourth of those who catch it, and disfigures the countenances, or ruins the health of a crowd of the survivors?—or would they return to small-pox inoculation, which renders the disease mild in those who are inoculated; but, by keeping up constant supplies of the contagion, spreads it continually among the uninoculated, and occasions a greater mortality than if inoculation was neglected?—or, lastly, will they continue vaccination, which affords perfect security from small-pox in an immense proportion of instances—when it does not prevent it, deprives it of its danger—and permits a severe or a fatal disease in only a few rare instances?

The importance of the general question has occupied us longer than we intended, and delayed our notice of the interesting pamphlet the title of which stands at the head of this Article. There are many persons whose prejudices against vaccination are utterly insurmountable; they dwell on the few instances which they have known of small-pox after cow-pox, and forget the many in which the latter has afforded complete protection from the former; they dwell on a few instances of inoculated small-pox which were mild and ended prosperously, and forget that even the inoculated disease sometimes occasions death, disfigurement, or ruined health. We advise these unreasonable persons to mix a little wisdom with their folly, and if they insist on inflicting the small-pox on their infants, to adopt the method

recom-

recommended by Dr. Ferguson in this pamphlet. If a person who has had neither cow-pox nor small-pox is first vaccinated, and a few days afterwards inoculated with the small-pox, the two diseases proceed together; but the cow-pox so completely curbs the small-pox as to deprive it of more than half its length and all its danger. Of this curious and important fact Dr. Ferguson proposes to take advantage;—his object is, by vaccinating a few days before inoculating with the small-pox, to generate a disease as mild as chicken-pox, and as capable of protecting the patient from subsequent small-pox as full-length small-pox itself. The plan, the way in which he learnt it, and the whole development of the scheme betray an observing, thoughtful, and judicious mind.

The incident which first led him to this view of the subject is very striking. There were three children in a poor family, two boys a few years old, and one infant at the breast; the two boys caught the small-pox—the mother, fearing that the infant, from its tender age, would sink under this formidable disease, consented to have it vaccinated, but it had already imbibed the small-pox, of which the eruption came out a few days after vaccination. But although the cow-pox was too late altogether to prevent the small-pox, it effectually curbed its violence, rendering it so mild and short that it resembled chicken-pox, so that, although the infant had not sickened till some time *after* the two elder boys, it was quite well several days *before* they were convalescent.

‘Reflecting,’ says Dr. Ferguson, ‘on these three cases, it was evident to me that that form of small-pox known by the name of the modified small-pox, or the varioloid disease, was the mildest. I thought then that if I could generate it artificially, I should produce a disease which would unite all the certainty of small-pox in defending the constitution from any subsequent attacks of this horrible malady with the mildness of the chicken-pox. I saw, too, that the experiment had already been made in the case of the infant, for it had been exposed to the contagion of the small-pox, and also to that of the cow-pox, and that the result was a mild form of disease.’

The proof that, when cow-pox and small-pox meet at the same time and in the same person, the former restrains the violence of the latter, and converts it into a disease as trifling as chicken-pox, is corroborated by numerous experiments accidentally made before the nature of the process was understood. When vaccination was first discovered, Dr. Woodville vaccinated 500 persons in the Small-Pox Hospital, and soon afterwards inoculated several of them with the small-pox. In many (about three-fifths) of these patients there came out an eruption resembling that of small-pox; most of them had no fever, and the eruption disappeared in a few days. The disease

thus produced was so short and slight that Dr. Woodville took it for the effect of vaccination. It is now certain that these patients had caught the small-pox about the time when they were vaccinated, and that the eruption was that of small-pox restrained by cow-pox. A few years afterwards Dr. Willan published some similar observations, together with the true explanation. He found that if the small-pox was inoculated within a week after vaccination, the patient had an eruption of small-pox pustules; but that if the inoculation was delayed till the ninth day after vaccination it produced no effect.

Thus, the fact had been ascertained by numerous experiments, but it remained for Dr. Ferguson to employ it as a means of restraining the violence of small-pox; and for this he deserves great credit. These little steps in thought are great steps in the progress of human power; even Jenner's discovery consisted only in employing that as an art which was already known by numerous accidental experiments.

Before adopting the scheme two questions will occur to the considerate reader—1st. Whether previous vaccination may be depended on for abbreviating and ameliorating small-pox?—2d. Whether this abbreviated small-pox secures the patient from subsequent small-pox, like small-pox in the ordinary form? As to the first of these questions, the restraining efficacy of previous vaccination has been proved by ample experience. It rests not merely on the cases which have been witnessed by Dr. Ferguson, but on the experiments of Dr. Willan, and on the numerous cases which occurred to Dr. Woodville in the Small-pox Hospital. As to the second of these questions, we have all the evidence which the nature of the subject admits of. From the introduction of vaccination down to the present time, cases of abbreviated small-pox after cow-pox have been continually occurring; every one of these is an instance of the disease which Dr. Ferguson proposes to generate, yet we do not remember to have heard of one which was ever followed by a subsequent attack of the disease.

When the small-pox is inoculated, medicines are used to prepare the constitution, and to diminish as much as possible the violence and danger of the disease; but for these objects there are no medicines equal to a previous vaccination.

We do not recommend Dr. Ferguson's scheme as a substitute for vaccination—there is this decisive reason against its general adoption, that, like common inoculation, it would keep up a perpetual supply of the small-pox contagion, and thus augment the mortality occasioned by the small-pox: but the large class of *extremely cautious* persons we have already alluded to, cannot find elsewhere a guide either so ingenious or so safe as this author.

ART.

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VACCINATION

